

In re: Kim et al.  
Serial No.: 10/054,540  
Filed: January 22, 2002  
Page 4 of 6

### REMARKS

Applicants appreciate the Final Office Action of April 15, 2003. Applicants have amended Claim 1 and respectfully submit that Amended Claim 1 and the claims that depend therefrom are patentable over the cited reference for at least the reasons discussed below. Applicants respectfully request that the Examiner enter the present amendment as it puts the present case in condition for allowance, which is respectfully requested in due course.

#### Amended Claim 1 is Patentable over the Cited Reference

Claims 1-7 and 10-12 stand rejected under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 6,326,315 to Uchiyama *et al.* (hereinafter "Uchiyama"). Applicants respectfully submit that Amended Claim 1 and the claims that depend therefrom are patentable because many of the recitations of these claims are neither disclosed nor suggested by the cited reference. For, example, Amended Claim 1 recites

An integrated circuit ferroelectric memory device, comprising:  
an integrated circuit transistor having a source region and a drain region;  
a ferroelectric capacitor on the integrated circuit transistor having first and second sidewalls, the ferroelectric capacitor including a first electrode adjacent the transistor, a second electrode remote from the transistor and a ferroelectric film therebetween;  
a contact plug directly connected to the first electrode that electrically couples the ferroelectric capacitor to the source region of the integrated circuit transistor;  
an insulating layer on the first and second sidewalls of the ferroelectric capacitor, the insulating layer having a surface that is substantially coplanar with an upper surface of the second electrode; and  
a plate line directly on the ferroelectric capacitor.

Applicants respectfully submit that at least the highlighted portions of, for example, Amended Claim 1, are neither disclosed nor suggested by Uchiyama for at least the reasons discussed below.

The Final Office Action states that Figure 1 of Uchiyama discloses all of the recitations of, for example, Claim 1. *See* Office Action, page 2. As discussed in Uchiyama:

A first interlayer dielectric layer (ILD) 116 made of BPSG (boron-doped phospho-silicate glass) is formed on substrate 102 and field oxide region 104. ILD 116 is patterned to form vias 117, 118 to source region 106 and drain region 108, respectively. Vias 117, 118 are filled to form plugs 119, 120, respectively. Plugs 119, 120 are electrically conductive and typically comprise polycrystalline silicon. A diffusion barrier layer 121 is formed and patterned on ILD 116 to be in electrical

In re: Kim et al.  
Serial No.: 10/054,540  
Filed: January 22, 2002  
Page 5 of 6

**contact with plug 120. The diffusion barrier layer 121 is made of, for example, titanium nitride, and typically has a thickness of 10 nm to 20 nm. Diffusion barrier layers, such as titanium nitride, inhibit the diffusion of chemical species between the underlying and overlying layers of the memory 100.**

See Uchiyama, column 5, line 58 to column 6, line 4. In other words, Uchiyama discusses a diffusion barrier layer 121 between the plug 120 and a bottom electrode layer 122 of the ferroelectric capacitor. Furthermore, the plug 120 electrically connects the diffusion barrier layer 121 to the drain 108 of the transistor. In contrast, for example, Claim 1 of the present invention recites a contact plug **directly connected to the first electrode that electrically couples the ferroelectric capacitor to the source region of the integrated circuit transistor.** Accordingly, nothing in the cited reference discloses or suggests the highlighted recitations of, for example, Amended Claim 1.

Accordingly, Claim 1 is patentable over the cited references for at least the reasons discussed above. Furthermore, dependent Claims 2-7 and 10-12 are patentable at least per the patentability of Independent base Claim 1, from which they depend. Accordingly, Claims 1-7 and 10-12 are in condition for allowance, which is respectfully requested in due course.

Furthermore, many of the dependent claims are independently patentable. For example, Claim 6 recites:

A device according to Claim 1, further comprising a stripe line adjacent the second electrode and remote from the first electrode.

The Final Office Action states that the plate line and the stripe line recited in the claims of the present invention are both taught by the wiring 139 of Uchiyama. See Office Action, page 2. The wiring 139 cannot teach both the plate line and the stripe line as recited in the claims of the present invention. Anticipation under 35 U.S.C. § 102 requires the cited reference to teach every recitation of the claimed invention. Nothing in Uchiyama discloses or suggests a stripe line as recited in Claim 6. Accordingly, Claim 6 is not anticipated by Uchiyama and, therefore, is independently patentable over Uchiyama.

#### CONCLUSION

Applicants have amended Claim 1 and submit that Claim 1 and the claims that depend therefrom are patentable over the cited reference for at least the reasons discussed above. Applicants also submit that many of the dependent claims are also independently patentable.

In re: Kim et al.  
Serial No.: 10/054,540  
Filed: January 22, 2002  
Page 6 of 6

Thus, Applicants respectfully request that the present amendment be entered and submit that the above-entitled application is now in condition for allowance. Favorable reconsideration of this application, as amended, is respectfully requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (919) 854-1400.

It is not believed that an extension of time and/or additional fee(s)-including fees for net addition of claims-are required, beyond those that may otherwise be provided for in documents accompanying this paper. In the event, however, that an extension of time is necessary to allow consideration of this paper, such an extension is hereby petitioned under 37 C.F.R. §1.136(a). Any additional fees believed to be due in connection with this paper may be charged to our Deposit Account No. 50-0220.

Respectfully submitted,



Elizabeth A. Stanek  
Registration No. 48,568

FAX RECEIVED

JUN 16 2003

TECHNOLOGY CENTER 2800

Customer Number:



20792

PATENT TRADEMARK OFFICE

### CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being sent by facsimile transmission to Mail Stop AF, Commissioner for Patents, Alexandria, VA, at (703) 872-9319 on June 16, 2003.



Rosa Lee Brinson  
Date of Signature: June 16, 2003